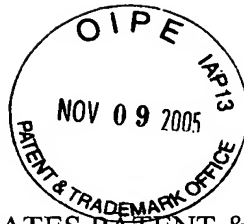


DOCKET NO: 217911US0CIP



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
SATOSHI NIYAMA, ET AL. : EXAMINER: DUONG  
SERIAL NO: 10/028,787 :  
FILED: DECEMBER 28, 2001 : GROUP ART UNIT: 2871  
FOR: LIQUID CRYSTAL OPTICAL :  
ELEMENT AND TEST METHOD FOR ITS  
BOUNDARY LAYER

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicant requests review of the final rejection in the above-identified application.  
No amendments are being filed with this request.

This request is being filed with a Notice of Appeal.

The review is requested for the reason(s) stated on the attached sheet(s). No more than five (5) pages are provided.

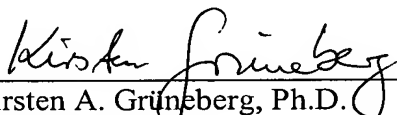
I am the attorney or agent of record.

Respectfully submitted,

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ATTACHMENT TO PRE-APPEAL BRIEF REQUEST FOR REVIEW

The present invention as set forth in **Claim 1** relates to a **chiral nematic liquid crystal optical element**, comprising:

a pair of substrates with transparent electrodes; and

a liquid crystal layer having a memory property interposed between the substrates;

a first resin layer which is provided on one of the transparent electrodes,

**said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer;**

**a non-alignment layer of a second resin layer, a vertical alignment layer of a second resin layer or a horizontal alignment layer of a second resin layer which is provided between the liquid crystal layer and the other of the transparent electrodes;**

**wherein said liquid crystal layer exhibits a planar state and a focal conic state.**

Claims 2-4 and 11-18 and 27 depend on Claim 1.

Regarding **Claim 1 and the claims dependent thereon**, Applicants respectfully request pre-appeal review of the following issues:

1) Anticipation rejection. Claims 1, 2, 11-13, 18 and 27 were rejected under 35 U.S.C. 102(b) over West et al.

West et al fails to disclose a first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer; and a second resin layer which is a non-alignment layer, a vertical alignment layer or a horizontal alignment layer.

The multistable chiral nematic displays of West et al use either no alignment layer (West et al, Example 1) or unrubbed polyimide (West et al, col. 7, line 4, Example 2) or other materials (West et al, col. 7, lines 1-10). There is no disclosure or suggestion of a material having **vertical alignment** capability. In other words there is no alignment layer that interacts with the liquid crystal in such a manner that vertical alignment of the liquid crystal

results. The disclosed polyimide is usually used for horizontal direction alignment. West et al merely disclose that the resin layers on **opposite substrates are rubbed in parallel or perpendicular with respect to each other**. See col. 7, lines 6-10; col. 9, lines 6-10. A homeotropic state in West et al is only achieved under the influence of an electric field (col. 2, lines 52-54, Fig. 2) for the purpose of resetting the LC phase in a display area. The homeotropic state in West et al has nothing to do with the alignment layer. Thus, there is no vertical alignment layer in West et al. Thus, the present invention cannot be anticipated by West et al.

2) Obviousness rejection. Claims 3, 4, 14, 16 and 17 were rejected under 35 U.S.C. 103 (a) over West et al in view of JP 08-220326.

West et al discloses that best results have been obtained using rubbed ITO without any additional surface treatments (West et al, col. 7, lines 9 and 10). Thus, West et al not only fail to disclose or suggest a resin layer having a rubbed vertical alignment surface, West et al also teaches away from using a resin layer having a rubbed vertical alignment surface.

JP 08-220326 fails to cure the defects of West et al because there is **no vertical alignment layer as claimed**. In fact, there is no resin layer in contact with a liquid crystal layer as required by the claims of the present invention. Applicants have previously filed a **Certified English Translation of the front page of JP 08-220326**. The invention of **JP 08-220326 is a color filter**. This color filter can be used for an LCD. However, no explanation about an inner surface layer being good for LCD material is described. However, West et al is designed for a scattering state and a light reflecting state of green, red, blue or any pre-selected color depending on the pitch length of the chiral nematic LC. Thus, inherently, **West et al do not require a color filter**. Therefore, the combination with JP 08-220326 is improper. However, even if combined with West et al, the claimed invention cannot result. The proposed device based on a combination of West et al and JP 08-220326 does not have

the claimed alignment: one rubbed vertical alignment layer combined with a non-alignment layer, a vertical alignment layer or a horizontal alignment layer.

3) Obviousness rejection. Claim 15 was rejected under 35 U.S.C. 103 (a) over West et al in view of JP 08-220326 and further in view of Khan et al.

Khan et al disclose a liquid crystal device having a chiral nematic liquid crystal (Khan et al, abstract). However, Khan et al do not cure the defects of West et al and JP 08-220326 because there is no alignment as claimed: one rubbed vertical alignment layer combined with a non-alignment layer, a vertical alignment layer or a horizontal alignment layer. Thus, even a combination of West et al, JP 08-220326 and Khan et al does not result in the claimed invention.

Further, the present invention as set forth in **amended Claim 5** relates to a **chiral nematic liquid crystal optical element**, comprising:

a pair of substrates with transparent electrodes; and

a liquid crystal layer having a memory property interposed between the substrates;

**a metal-oxide layer provided on at least one of the transparent electrodes;**

a first resin layer which is provided on one of the transparent electrodes,

**said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer;**

**a non-alignment layer of a second resin layer, a vertical alignment layer of a second resin layer or a horizontal alignment layer of a second resin layer which is provided between the liquid crystal layer and the other of the transparent electrodes;**

**wherein said liquid crystal layer exhibits a planar state and a focal conic state.**

Claims 6-8 and 19-23 and 28 depend on Claim 5.

Regarding **Claim 5 and the claims dependent thereon**, Applicants respectfully request pre-appeal review of the following issues:

4) Obviousness rejection. Claims 5 and 23 were rejected under 35 U.S.C. § 103(a) over West et al in view of Konuma et al. In addition, the Examiner cited Gotoh et al, JP 08-220326, and Khan et al to reject other claims depending on Claim 5.

West et al provide no disclosure or suggestion of the claimed alignment, which requires that there is one rubbed vertical alignment layer combined with a non-alignment layer, a vertical alignment layer or a horizontal alignment layer. In addition, as acknowledged by the Examiner, West et al fail to disclose or suggest a metal oxide layer provided on at least one of the transparent electrodes (Office Action of December 28, 2004, page 5, line 5 and 4 from the bottom).

The combination with Konuma et al does not result in a chiral nematic liquid crystal optical element as claimed because the proposed combination lacks one rubbed vertical alignment layer combined with a non-alignment layer, a vertical alignment layer or a horizontal alignment layer.

Gotoh et al has been cited to show a driving voltage as in Claim 6. However, the combination of West et al, Konuma et al and Gotoh et al does not result in the claimed invention because the proposed combination lacks one rubbed vertical alignment layer combined with a non-alignment layer, a vertical alignment layer or a horizontal alignment layer.

JP 08-220326 fails to disclose or suggest a resin layer having a rubbed vertical alignment surface. In fact, all that this reference discloses is a color filter. West et al do not require a color filter. Therefore, the combination with JP 08-220326 is improper.

Khan et al disclose a liquid crystal device having a chiral nematic liquid crystal (Khan et al, abstract). The Examiner has cited the reference to show insulating layers as in Claim

20. However, Khan et al do not cure the defects of West et al, Konuma et al and JP 08-220326 because there is no alignment as claimed: one rubbed vertical alignment layer combined with a non-alignment layer, a vertical alignment layer or a horizontal alignment layer. Thus, even a combination of West et al, JP 08-220326, Konuma et al and Khan et al does not result in the claimed invention.

### **CONCLUSION**

In view of the above remarks, the Applicants respectfully request that the rejections of record be withdrawn.